

RECEIVED

1 FEB 1951

Report on Steam Turbine Machinery.

No. 123028

GENERATOR.

Bel 15283

Port of London Received at London Office
Date, First Survey 3-4-51 Last Survey 17-7-51
(Number of Visits 10)
on the Rhodesia Castle
By whom built Harling & Wolff Ltd Yard No. 1431 When built 1951
By whom made Leeds Brothers Ltd Engine No. 320600 When made 1951
By whom made Union Castle Line Ltd Boiler No. 20600 When made
Shaft Horse Power at Full Power 550 each Owners Union Castle Line Ltd Port belonging to London
Nom. Horse Power as per Rule MN 92 Is Refrigerating Machinery fitted for cargo purposes Is Electric Light fitted Yes
Trade for which Vessel is intended

STEAM TURBINE ENGINES, &c.—Description of Engines 22" dia - 8 Stage. One Curtis and 4 Lötze Impulse Type.
No. of Turbines One Direct coupled, single reduction geared to Dynamo propelling shafts. No. of primary pinions to each set of reduction gearing One.
Direct coupled to { Alternating Current Generator phase periods per second } rated 750 Kilowatts 225 Volts at 800 revolutions per minute;
or supplying power for driving aux machs Direct Current Generator
rated 750 Kilowatts Volts at revolutions per minute. Direct coupled, single or double reduction geared to propelling shafts.

TURBINE LOADING.	H. P.			I. P.			L. P.			ASTERN.		
	HEIGHT OF BLADES.	DIAMETER AT TIP.	NO. OF ROWS.	HEIGHT OF BLADES.	DIAMETER AT TIP.	NO. OF ROWS.	HEIGHT OF BLADES.	DIAMETER AT TIP.	NO. OF ROWS.	HEIGHT OF BLADES.	DIAMETER AT TIP.	NO. OF ROWS.
1st Expansion	<u>7"</u>	<u>22.825"</u>	<u>1 Curtis</u>									
2nd	<u>1.76"</u>	<u>23.885"</u>										
3rd	<u>.845"</u>	<u>22.97"</u>										
4th	<u>.945"</u>	<u>23.07"</u>										
5th	<u>1.11"</u>	<u>23.235"</u>										
6th	<u>1.67"</u>	<u>23.795"</u>										
7th	<u>2.47"</u>	<u>25.095"</u>										
8th	<u>3.16"</u>	<u>26.285"</u>										
9th	<u>4.85"</u>	<u>28.475"</u>										
10th												
11th												
12th												

Shaft Horse Power at each turbine H.P. 750 kW. I.P. 6000 1st reduction wheel 800
L.P. 3 1/2 main shaft

Motor Shaft diameter at journals H.P. 3 1/2 Pitch Circle Diameter { 1st pinion 6.10847 1st reduction wheel 45.8846 Width of Face { 1st reduction wheel
I.P. 9 3/8 2nd pinion main wheel main wheel 10"
L.P. 10 1/8 2nd pinion main wheel main wheel 10 3/4

Distance between centres of pinion and wheel faces and the centre of the adjacent bearings { 1st pinion 44 1/4 1st reduction wheel
2nd pinion 41 3/8 2nd reduction wheel 5.88587

Pinion Shafts, diameter at bearings External { 1st 44 1/4 2nd 41 3/8 Generator Shaft, diameter at bearings
Internal { 1st 41 3/8 2nd 46.0446 Propelling Motor Shaft, diameter at bearings

Wheel Shafts, diameter at bearings { 1st 5 1/2 2nd 7 1/2 diameter at wheel shroud, { 1st 41 3/8 2nd 46.0446
main as per rule Thrust Shaft, diameter at collars as per rule

Intermediate Shafts, diameter as fitted Tube Shaft, diameter as per rule Screw Shaft, diameter as fitted Is the { tube } shaft fitted with a continuous liner {
as fitted

Bronze Liners, thickness in way of bushes as per rule Thickness between bushes as fitted Is the after end of the liner made watertight in the
as fitted

Propeller boss If the liner is in more than one length are the junctions made by fusion through the whole thickness of the liner
the liner does not fit tightly at the part between the bearings in the stern tube, is the space charged with a plastic material insoluble in water and non-corrosive.

Two liners are fitted, is the shaft lapped or protected between the liners. Is an approved Oil Gland or other appliance fitted at the after end of the tube
aft If so, state type Length of Bearing in Stern Bush next to and supporting propeller.

Propeller, diameter Pitch No. of Bades State whether Moveable Total Developed Surface square feet
Single Screw, are arrangements made so that steam can be led direct to the L.P. Turbine Can the H.P. or I.P. Turbines exhaust direct to the

Condenser No. of Turbines fitted with astern wheels Feed Pumps { No. and size
How driven

Pumps connected to the Main Bilge Line { No. and size
How driven

Ballast Pumps, No. and size Lubricating Oil Pumps, including Spare Pump, No. and size 1 main pump Gray type 30 GPM.
1000 Anti-fouling pump 30 GPM.

Are two independent means arranged for circulating water through the Oil Cooler Suctions, connected both to Main Bilge Pumps and Auxiliary
Bilge Pumps, No. and size:—In Engine and Boiler Room In Pump Room

Holds, &c. Main Water Circulating Pump Direct Bilge Suctions, No. and size Independent Power Pump Direct Suctions to the Engine Room
Bilges, No. and size Are all the Bilge Suction pipes in Holds and Tunnel Well fitted with strum-boxes

Are the Bilge Suctions in the Machinery Space led from easily accessible mud-boxes, placed above the level of the working floor, with straight tail pipes to the bilges.
Are all Sea Connections fitted direct on the skin of the ship Are they fitted with Valves or Cocks

Are they fixed sufficiently high on the ship's side to be seen without lifting the stokehold plates Are the Overboard Discharges above or below the deep water
Are they each fitted with a Discharge Valve always accessible on the plating of the vessel Are the Blow Off Cocks fitted with a spigot and brass
covering plate What pipes pass through the bunkers How are they protected

What pipes pass through the deep tanks Have they been tested as per rule
All Pipes, Cocks, Valves and Pumps in connection with the machinery and all boiler mountings accessible at all times.
The arrangement of valves and their connections such as to prevent the possibility of water passing from the sea or from water tanks into the cargo or machinery
spaces, or from one compartment to another Is the Shaft Tunnel watertight Is it fitted with a watertight door worked from

005353-005354-0074

BOILERS, &c.—(Letter for record.....) Total Heating Surface of Boilers.....

Is Forced Draft fitted..... No. and Description of Boilers..... Working Pressure.....

Is a Report on Main Boilers now forwarded?

Is { a Donkey } Boiler used?..... If so, is a report now forwarded?
{ an Auxiliary }

Is the donkey boiler intended to be used for domestic purposes only.....

Plans. Are approved plans forwarded herewith for Shafting..... Main Boilers..... Auxiliary Boilers..... Donkey Boilers.....
(If not, state date of approval)

Superheaters..... General Pumping Arrangements..... Oil Fuel Handling Arrangements.....

SPARE GEAR.

Has the spare gear required by the Rules been supplied..... Yes.

State the principal additional spare gear supplied. 1 Set of Turbine & Governor Bearings. 1 Worm & Wheel for Governor Drive. 1 Set of Labyrinth Stands. 1 Governor Spindle, Valve & Seat. 1 Set of Thrust Pins. 1 Set of Governor Wearing Parts. 1 Complete Set of all Springs. 1 Closed Sea Control Internal Valve. 1 Closed Sea Control Valve Half Shaft. 1 Closed Sea Control Valve Half Reverser. 1 Set of Air Ejector Nozzles. 1 Air Ejector H.R.V. 1 Extractor Pump Impeller. 1 Circulating Pump Impeller. 1 Pump Drive Shaft.

The foregoing is a correct description,

PETER BROTHERHOOD LTD.
J. Bellamy
DIRECTOR

Dates of Survey while building { During progress of work in shops - - 29/5/51. 1/6/51. 12/6/51. 3/7/51. 17/7/51.
During erection on board vessel - - -
Total No. of visits. 5 in shops.

Dates of Examination of principal parts—Casings. 12/6/51. Rotors. 12/6/51. Blading. 15/7/51. 17/7/51. Gearing. 5/7/51. 17/7/51.

Wheel shaft. 5/7/51. 17/7/51. Thrust shaft. - Intermediate shafts. - Tube shaft. - Screw shaft. -

Propeller. - Stern tube. - Engine and boiler seatings. - Engine holding down bolts. -

Completion of fitting sea connections. Completion of pumping arrangements. Boilers fixed. Engines tried under steam.

Main boiler safety valves adjusted. Thickness of adjusting washers.

Rotor shaft, Material and tensile strength. Longa Steel 50.8 x 51.0 tons. Identification Mark. 79242 60747 9551. F 565

Flexible Pinion Shaft, Material and tensile strength. Identification Mark.

Pinion shaft, Material and tensile strength. Longa Steel. 47.4 x 47.6 tons. Identification Mark. 4757. JS. 15/6/51. 425. B. 1422 SW. 22/9/51. 1424 GFS 27/7/51.

1st Reduction Wheel Shaft, Material and tensile strength. Longa Steel. 32.8 x 32.0 tons. Identification Mark.

Wheel shaft, Material. Identification Mark. Thrust shaft, Material. Identification Mark.

Intermediate shafts, Material. Identification Marks. Tube shaft, Material. Identification Marks.

Screw shaft, Material. Identification Marks. Steam Pipes, Material. Test pressure.

Date of test. 4/7/51 and 13/7/51. Is an installation fitted for burning oil fuel.

Is the flash point of the oil to be used over 150°F. Have the requirements of the Rules for the use of oil as fuel been complied with.

Is the vessel (not being an oil tanker) fitted for carrying oil as cargo. If so, have the requirements of the Rules been complied with.

If the notation for ice strengthening is desired, state whether the requirements in this respect have been complied with.

Is this machinery a duplicate of a previous case. Messrs Pol's Brotherhood Ltd Standard 22" dia Turbine. If so, state name of vessel.

General Remarks. (State quality of workmanship, opinions as to class, &c.) These two turbine generator engines together with their reduction gearing and integral condensing plant have been built under survey in accordance with the approved plans and the requirements of the rules. Steel used in the manufacture has been made at works approved by the Committee, and with the exception of the turbine rotors, under the supervision of the Shipyard Surveyor. The two rotors have been taken from stock and accepted on manufacturers' Test Certificates verified by Bureau of Check Test's office, machining and considered satisfactory. The workmanship is good, and the machinery is in my opinion, eligible to be fitted in a closed ship. Satisfactory full power running trials and governor tests have been witnessed at the makers' works, with each turbine coupled to its respective dynamo, but only approx 20% overload could be obtained due to the limited capacity of the resistance tanks. It is recommended that paralleling trials be carried out on board as each generator was running separately on Test bed. Turbine No 20600 A coupled to A.M. Dynamo No 9882 and Turbine No 20600 B to A.M. Dynamo No 9881.

The amount of Entry Fee ... £ 43 : 6 : 27/8/19 51

Special ... £ 36 : 10 : 27/8/19 51

Donkey Boiler Fee ... £ : : When received.

Travelling Expenses (if any) £ 5 : 5 : 19

TUES. 4 DEC 1951

Committee's Minute.

Assigned. See F.E. Mchly. rpt. Bel. 5283

These Generating Sets installed on board, and examined under working conditions with satisfactory results.

L. Roth

Engineer Surveyor to Lloyd's Register of Shipping.

Lloyd's Register Foundation